the more study and labour is directed to this department of an engineer's practice, the more forcibly is the truth impressed that an arrival at strict accuracy is yet far from being attained. It is one of the prerogatives of talent to be able to fix upon truth, and to rescue the diamond from its commoner, the pebble; but until the times be redeemed from a sudden and an indecent haste in the construction of public works,—until thought is rescued from being starved and stunted in its growth,—until science is lifted out from the student's cell "and made honourable," money will still be wastefully lavished, devoted to the putting up of works, to become, in after times, a byeword by reason of their unmeaningness and their glaring imperfectness; and we shall still be compelled to go on entombing thought and erecting error over truth.

As a contribution towards arriving at an approximation to truth, this table, it is hoped, may be found of use:—

INCLINATION 1 IN 100.

Diameter.		Discharge from smooth Brick Culverts.	Discharge from Stoneware Pipes.	Discharge from Glazed ware Pipes.
Feet.	Inches.	Cubic Feet per Minute.	Cubic Feet per Minute.	Cubic Feet per Minute.
0	3	9·56	9·95	11·34
0	4	18·75	20·01	22·95
0	5	32·69	35·02	39.75
0	6	52·21	55·48	62·72
0	7	76·65	81·47	92·05
0	8	106·95	113·85	128·32
0	9	143·44	153·25	173·47
0	10	186·73	199·06	224·23
0	11	236·75	252·48	283·97
0	12	294·8	314·4	353·7

It may be added, that in conducting the tabulated observations, care was taken in forming the interior surfaces even: the joints were closed with cement. The rate of inclination in each case was uniform.

FRED. JACKSON.

GLASS IN DECORATIVE ART.

ALL our ideas of Oriental splendour—all the gorgeous imaginings of Orientals, themselves, of a splendour more than Oriental, in the fairy palaces of Arabian genii—might now be realised, to sight at least, in the sober actualities of British decorative art in glass. The lustre of silver and gold, the fiery sparkle of the ruby, amethyst, and every actual or imaginable gem, and the more subdued, but no less beautiful, hues of the pearl and the tropical shell, may now, by the recent efforts of British skill and invention, be combined, at a moderate cost, and without a vestige of mere gaudy glitter, in the decoration of the mansions of the gentlemen of England, so as to realise to the eye of taste far more than even the most princely magnificence could heretofore have realised.

It is our present purpose to give a brief account of these inventions, and first, and most especially, of those more particularly devoted to architectural details. These, too, merit all the more a prominent notice, inasmuch as the patentee, a lady of independent means, has destined the profits of her various inventions to the improvement of the condition of the female sex in this her native island. Moreover, the patent under which the inventions of Miss Wallace are, or ought to be, protected, comes, if we mistake not, first in order of date amongst those now to be noticed. With her peculiar claims, however, we have here less to do than with the merits of her productions. These consist, in principle, of imitations of gold and silver in glass, without the use of either metal, —of the protection of actual gilding or silvering under an almost invisible, yet magnifying coat of glass,—of a peculiar mode of adding metallic and pearly brilliancy to colours, to painted and stained figures, and to engravings, all in glass,—of imitations of marbles, alabaster, malachite, &c., in glass covered compositions,—of imitations of precious stones,—and of other inventions.

Among the various forms under which these are brought into use, in architectural decoration, by Mr. Holtorp, to whose management they are committed, are those of ceilings, in which a combination of them, with a peculiar mode of enamelling in white or pale blue on the inner surface of the interspaces in glass (another of this lady's numerous inventions, also applied with good effect to framed engravings), is capable of producing a dazzling effect, particularly by night, with a good, or even an indifferent, light reflected from it. Mouldings and cornices are made, to harmonise with these effects, and the same combinations, varied with the pearly brilliance of painted flower-wreaths, and wreaths of silver engraved on a gold surface, all in glass, are made to adorn the walls in form of picture-frames. Besides a number of these productions, in varied detail, we saw a specimen of stained-glass decoration for windows, in form of armorial bearings, in vivid colours, made peculiarly sparkling and brilliant, and, in some phases, pearly, by one of the processes already alluded to.

One great feature in most of these inventions, is, that the materials wherewith the effects are produced, wherever these consist of gilt copper mouldings, or even gilt paper, velvet, &c., are all protected, mostly within hollow mouldings of glass hermetically sealed, so that the gilding, &c., can never tarnish, and the whole is in this respect everlasting. So is it with the marble imitations, which are so firmly imbedded in composition that they are said to be quite well adapted to all the risks of exterior construction, for which they are designed, as well as for chimney-pieces and other forms of interior decoration.

Miss Wallace has proposed to the International Exhibition Commissioners, that the hall of glass be allowed to remain as a winter garden, open to the public, and be decorated at small cost by her processes. She also expects to be able to exhibit, in 1851, specimens of glass deprived in great measure of its brittleness.

The next inventions to be noticed are those of Mr. Hale Thomson, which, in principle, consist chiefly of a new mode of silvering all sorts of curved or other surfaces of glass, differing from Mr. Drayton's inasmuch as the nitrate of silver is held in a certain saccharine solution instead of oil of cloves, thus insuring, it is said, purity and permanence of colour. By an ingenious mode of moulding, the silver is lacquered on the glass *between* the outer and the inner surfaces, wherever, as in vases, cups, or other vessels, a double surface must be shown. The silver *diaphragm* or midriff, if we may be allowed so to call it, shining through the glass according to its colour, produces similitudes of silver cups lined with gold, or purely of silver or of gold, so perfect in appearance, as to have deceived the eye of a gold and silver smith; also ornamental vases and cups, which vie with the ruby, amethyst, jacinth, emerald, and other precious stones in their vivid reflections of colour. One cup seemed actually to blaze within with the fiery colour of the jacinth, another looked as if it were full of the most sparkling and luscious wine, and a third as if it were hollowed out of one enormous sapphire. One pair of vases of large size and beautiful tint, delicately engraved as if in *alto relievo* on silver, but in reality concave in all its rounded prominences, costs five hundred guineas. That, however, is an extreme price: two or three pounds appears to be the general cost of the smaller ornaments. The only application of this invention, as yet, to purposes more immediately architectural, at least which we observed, consisted of door-plates, with imitation knobs, apparently convex but really concave, and cut into the glass, with a colour like brass—a mere curiosity. Candlesticks showed, however, what might be done in ornamental pillars, cornices, or other decorations in apparent silver, gold, or translucid coloured stone. Metallic reflectors for light-house, railway, astronomical, or other purposes, protected of course by a glassy surface, merit notice from their brilliance.

In the forms to which these inventions have been applied there may yet be great improvement.

Mr. Kidd's process for illuminating, silvering, decorating, and embroidering glass girandoles, cheval, toilette, and other ornamental articles in glass remains to be noticed. We have here the hitherto plain surfaces of mirrors, &c., first engraved, or, as it is called, embroidered, in patterns, such as wreaths of flowers, by a new process of art, consisting of lathes with needle points for engraving, whereby, as in some of those already alluded to, a superior style of engraving on glass has been realised, constituting, in fact, a new branch of art. In this case Mr. Kidd has succeeded in silvering the engraved surface by a process not chemical like those of Mr. Thomson and Mr. Drayton, and the effect is excellent. The engraving, though on the inner surface of the glass, appears, in fact, as if raised upon the outer surface. In this way crests, armorial bearings for chairs or panels, and a variety of other decorations can be effected either in clear or coloured glass, as well as flower wreaths, fruit, landscapes, &c.; so that a new field is thus opened to artizans; and, when the means of embedding such art works solidly, and of protecting them from atmospheric and other injurious influences, are considered, the fragility of glass is in a great degree obviated, and the permanency of the work secured.

On the whole, we think we have made out the possibility, at least, of ultimately realising all those wonders in architectural and domestic decoration referred to in the outset, even by the aid of these new inventions in glass alone, and independently of all the other decorative appliances heretofore available to the architect, the upholsterer, and the decorative artist in general: at all events, when we think of it, the latter appliances are really few and puny by comparison with that potent phalanx of decorative materials by which they will now be reinforced. The love of decorative art in this country is rapidly on the increase, and we hope speedily to see the new era ushered in with a temperate and tasteful resort to all new and important inventions.

PUBLIC CONVENIENCES, AND POOR MENS' HOUSES.

UNDER this head I saw with pleasure in your last number some remarks on a subject which very much requires notice in other cities and large towns besides the metropolis. It is, as Mr. Stent justly observes, a delicate matter for the pen; but, after due consideration, I have long felt that by agitating such subjects the cause of delicacy will be better served than by silence; and that those who undertake the unpleasant duty of coming forward for that purpose will (by keeping the necessity for improvement before the public eye, as proof, as it seems blind to it in its every-day results) deserve well of their country for the self-denial implied by a prominence in the disagreeable task.

Since you were good enough to insert a few lines from me on the same subject in reference to moderately sized dwellings of 30*l.* to 40*l.* per annum,* a host of such dwellings have been commenced here, all of them having the same defects as were there pointed out. From conversations I have had with their owners and builders, I am well assured we shall have no improvement till it be made matter of legal compulsion on landlords: the tenant cannot help himself otherwise than by such agitation as may induce a *law* in reference to it, being obliged to put up with a choice of such houses as landlords choose to erect.

In the late able article on sanitary architecture, is a suggestion that "perhaps gutta percha will answer" as a substitute for lead, for lining cisterns. I can say positively that it will, having tried it months ago in more cases than one: but it will not do for *hot* water cisterns. Great care must be taken that the wood is *perfectly* dry, and the solution of gutta percha (such as is used for fastening wires to shores, liquified by immersion of the containing vessel in hot water, must be laid on in a good thick coat like paint, working the gutta percha with the brush well into the joints and corners. When cooled, a water-tight skin of gutta percha will be formed inside the cistern.

W.

THE BOLLING TESTIMONIAL.—In the chancel of the parish church at Bolton a window has been erected by public subscription, in memory of the late member of Parliament, William Bolling, Esq., and fitted with stained glass by Mr. Wailes. The window is of three lights, in each of which is represented two pictorial subjects having reference to the life of our Lord, either as a child himself or in connection with children. An engraved and enamelled brass plate, bearing a shield, with the arms of Bolling impaled with those of Slade, surmounted by the Bolling crest, is inserted in the stone work at the back of the sedilia, beneath the window, and under it a large oblong brass plate bears an appropriate inscription, in Gothic characters.

* See p. 330, ante.

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